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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Zhikai Wang

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EXAMINER

BERNSHTEYN, MICHAEL

ART UNIT

PAPER NUMBER

1796

MAIL DATE

DELIVERY MODE

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/572,917	Applicant(s) WANG ET AL.	
	Examiner MICHAEL M. BERNSHTEYN	Art Unit 1796	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☒ Claim(s) 24 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☒ Certified copies of the priority documents have been received in Application No. 10/667,367.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____. |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>05/08/06,03/21/06</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Specification

1. The spacing of the lines of the specification is such as to make reading difficult.

New application papers with lines 1½ or double spaced on good quality paper are required.

2. Applicant is reminded of the proper content of an Abstract of the Disclosure.

In chemical patent abstracts for compounds or compositions, the general nature of the compound or composition should be given as well as its use, *e.g.*, "The compounds are of the class of alkyl benzene sulfonyl ureas, useful as oral anti-diabetics." Exemplification of a species could be illustrative of members of the class. For processes, the type reaction, reagents and process conditions should be stated, generally illustrated by a single example unless variations are necessary.

Complete revision of the content of the abstract is required on a separate sheet.

Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

3. The abstract recites the limitation "in the Mowing order" which is unclear.

Appropriate correction is required.

Claim Objections

4. Claim 24 is objected to because of the following informalities:

Claim 24 recites the limitation ‘obtainable’. This rationale is applicable to polymer “obtainable” by a stated process because any variation in any parameter within the scope of the claimed process would change the polymer produced. One who made or used a polymer made by a process other than the process cited in the claim would have to produce a polymer using all possible parameters within the scope of the claim, and then extensively analyze each product to determine if this polymer was obtainable by a process within the scope of the claimed process. Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claim 12 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 12, the phrase "such" renders the claim indefinite because it is unclear whether the limitations following the phrase are part of the claimed invention. See MPEP § 2173.05(d).

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

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A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 1-11, and 18-21 are rejected under 35 U.S.C. 102(b) as being anticipated by Okamoto et al. (JP 2001-310926).

With regard to the limitations of claims 1-9, Okamoto discloses an acrylic urethane acrylate oligomer made from an acrylic diol, a diisocyanate and a hydroxyalkyl acrylate, which are substantially identical to the claimed acrylic urethane (meth) oligomer (pages 13-16, [0024]-[0028], Example 1, page 21, [0046])). The compound used for the initiator of the block polymerization has the thiol group and the hydroxyl group in the molecule (pages 10-11, [0018]). The molecular weight of the oligomer 500-10,000 and overlaps the claimed range (page 15, [0026]); therefore, for claimed molecular range of 1000 to 5000 Okamoto's reference anticipates the claimed invention.

With regard to the limitations of claims 10-11 and 16-17, Okamoto discloses that all the solvents and unreacted components are removed during the process of obtaining acrylic urethane acrylate oligomer (pages 23-24, [0056]), which is produced by first reacting diisocyanate with the acrylic polyol followed by reaction with the hydroxyalkyl acrylate (pages 18-20, [0033]-[0041]). The acrylic oligomer which has the polymerizable unsaturated group at the molecule terminal is a thing which is acquired as a solventless (page 24, [0057]).

With regard to the limitations of claims 18 and 20, Okamoto discloses that this oligomer can be used in radiation curable inks; as a raw material for UV/EV cured resin and curing sheet (pages 17-18, [0031]).

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With regard to the limitations of claim 19, Okamoto discloses that it is desirable to add a visualization photosensitizer, a metallocene compound as a catalyst (page 9, [0013]), and an organometallic compound (page 11, [0011]), etc.

With regard to the limitations of claim 21, Okamoto discloses that the acrylic polymer can be used as a binder for ink (examples as protection sheet, antistatic sheet, electroconductive sheet, curing sheet, an additive for toner, ink-fixing film, laminate film, etc. (pages 17-18, [0031]).

7. Claim 22 is rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Okamoto.

With regard to the limitations of claim 22, Okamoto does not disclose the ink composition, which has a color of black, cyan, magenta or yellow, a low ink misting of $\Delta E \leq 6$, and a 90-100% adhesion to vinyl, polystyrene and polycarbonate.

However, in view of substantially identical composition between Okamoto and instant claims, it is the examiner position that Okamoto's acrylic urethane acrylate oligomer inherently possesses these properties. Since the USPTO does not have equipment to do the analytical test, the burden is now shifted to the applicant to prove otherwise. **In re Fitzgerald** 619 F 2d 67, 70, 205 USPQ 594, 596 (CCPA 1980).

8. Claims 12-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Okamoto in view of Reusmann (2001/313369).

The disclosure of Okamoto's reference resided in § 7 is incorporated herein by reference.

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With regard to the limitations of claims 12-17, Okamoto discloses the claimed one pot process for making the oligomer composition, which comprises reacting the acrylic polymer polyol, diisocyanate, and hydroxy(meth)acrylate (pages 15-17, [0026]-[0030]). showing a solventless method or by not first reacting the diisocyanate with the hydroxyalkyl acrylate before reacting with the acrylic diol.

Reusmann shows, in his example, solventless preparation of the same oligomer. On page 3, in the schematics, he shows preparing the oligomer by first reacting the diisocyanate with the hydroxyalkyl acrylate or by first reacting with the acrylic diol.

Therefore it would have been obvious to one ordinary skill in the art to prepare the oligomers of Okamoto by first reacting the diisocyanate with the hydroxyalkyl acrylate because Reusmann shows it as equivalent to the process of Okamoto, and to use a solventless process per the teachings of Reusmann because it is simplified the process of preparation.

9. Claims 1-17 are rejected under 35 U.S.C. 102(b) as being anticipated by Reusmann (2001/313369).

With regard to the limitations of claims 1-11, Reusmann discloses the same urethane acrylate oligomers of the claims (see example 1) made by reacting diisocyanate with hydroxyalkyl acrylate followed by reaction with an acrylic diol having a molecular weight of 1000. Reusmann discloses the same diisocyanates (page 2, [0026]), the same hydroxyalkyl acrylates (page 2, [0028]), and the same monomers for the acrylic diol (see examples).

With regard to the limitations of claims 12-17, in the examples, Reusmann exemplifies the oligomers by a solventless method, and on page 3 in the two schematics, he shows substantially identical two methods for making the oligomer as the claims. Reusmann discloses that where the polyisocyanate used comprises a triisocyanate, it is particularly preferred in the same sense to set the molar ratio of .alpha.,.omega.-polymethacrylatediol to triisocyanate to hydroxyalkyl acrylate in the region of about 1:2:4, which is mainly within the claimed range (page 2, [0031]).

10. Claim 1-17 are rejected under 35 U.S.C. 103(a) as being unpatentable as obvious over Arndt et al. "One and Two-component UV Acrylic Urethane Coatings for Weatherable Applications", 80th Annual Meeting for the Federation of Societies for Coating Technology, October 30, 2002, Lyondell, PA, XP002310568.

With regard to the limitations of claims 1-17, Arndt discloses that low- or zero-VOC, sprayable acrylic urethane clearcoats have been developed for weatherable applications. One-component, UV-curable coatings were prepared using novel acrylated urethane acrylic resins. Two-component coating systems were developed using a partially acrylated urethane acrylic polyol and conventional 2K methane components, diluted in acrylate monomers and acetone. These coatings have excellent appearance, physical properties, and weatherability, suggesting that UV-curing clearcoat technology could be applied to automotive OEM and refinish applications, as well as wood and plastic parts. The 2K/UV formulations are particularly interesting, in that they offer the instantaneous cure and productivity of UV-curable coatings while maintaining the

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physical properties, weatherability, and low-cost characteristics of conventional 2K urethane systems (page 14).

The liquid acrylic/polyol was first treated with excess IPDI (isophorone diisocyanate) to form an isocyanate prepolymer, which was then capped with hydroxyethylacrylate (HEA). Excess IPDI is required to prevent gel formation when preparing the isocyanate prepolymer, because the hydroxyl functionality of acrylic polyol is greater than 5. The resulting product is a mixture of acrylated acrylic-urethane oligomer and acrylated IPDI reactive diluent. Ultimately, clear isocyanate-functional prepolymers were prepared at NCO/OH ratio as low as 2.2, which is clearly within the claimed range (page 5, fig. 6). Under controlled reaction conditions and catalyst concentrations, the acrylic polyols reacted with the primary isocyanate group of HDI leaving the secondary isocyanate group intact for subsequent reaction with HEA. This unique property of IPDI allows for easy control of the ratio of acrylated urethane-acrylic oligomer to IPDI diacrylate diluent and broader process latitude (page 5).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MICHAEL M. BERNSHTEYN whose telephone number is (571)272-2411. The examiner can normally be reached on M-Th 8-6:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu can be reached on 571-272-1114. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Ling-Siu Choi/
Primary Examiner, Art Unit 1796

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Examiner, Art Unit 1796

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Examiner, Art Unit 1796